# SOLUTION TO F/M/16/22

## QUICK ACCESS GRID

The solution to a particular question can be accessed instantly by clicking on the desired question number in the QUICK ACCESS GRID.

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| 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 |
| 36 | 37 | 38 | 39 | 40 |

# S1

# C

The binomial system uses a two-part name for an organism.

| | | |
|---|---|---|
| First part | Generic name* | Ranunculus |
| Second part | Specific epithet** | acris |

The specific name may be single or compound. It may include the name of the discoverer in full or in abbreviation.
The name is printed in italics and underlined in a handwritten description.

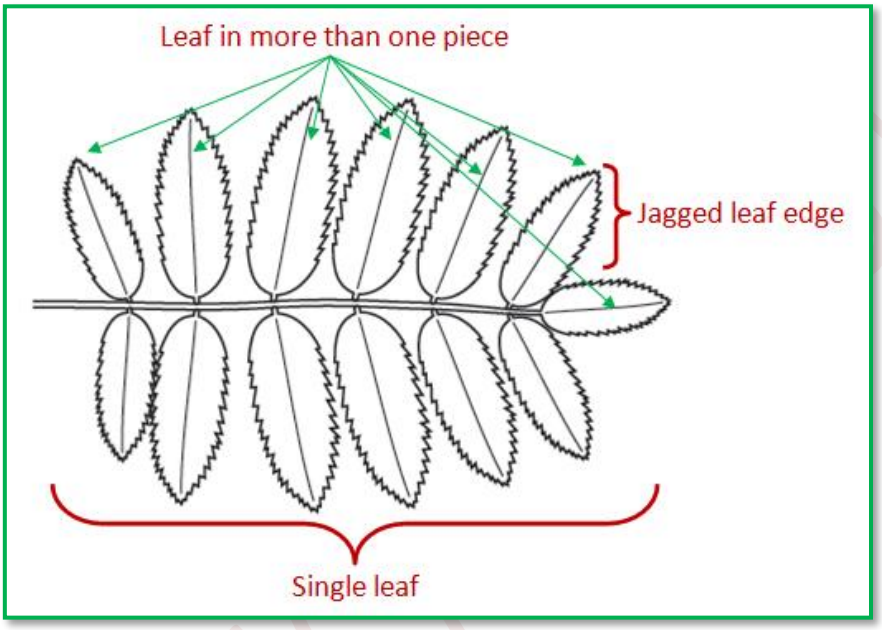
*Generic = of the genus
**Specific = of the species



BACK TO QUICK ACCESS GRID

# S2

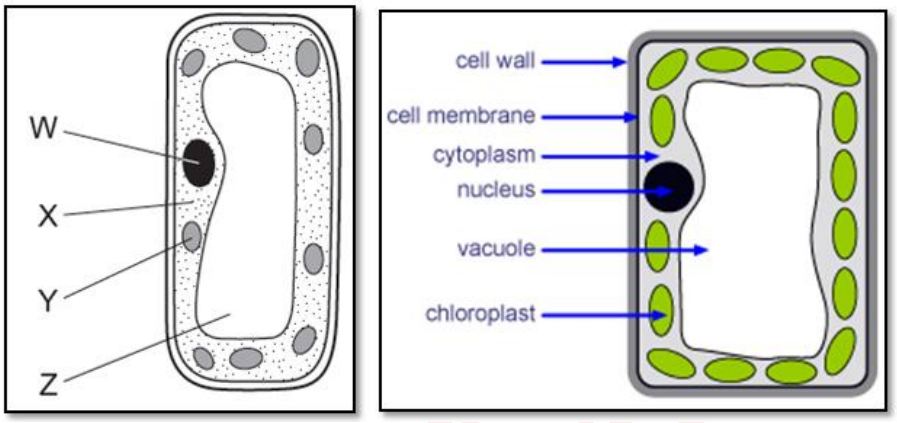
# D




BACK TO QUICK ACCESS GRID

# S3

# D

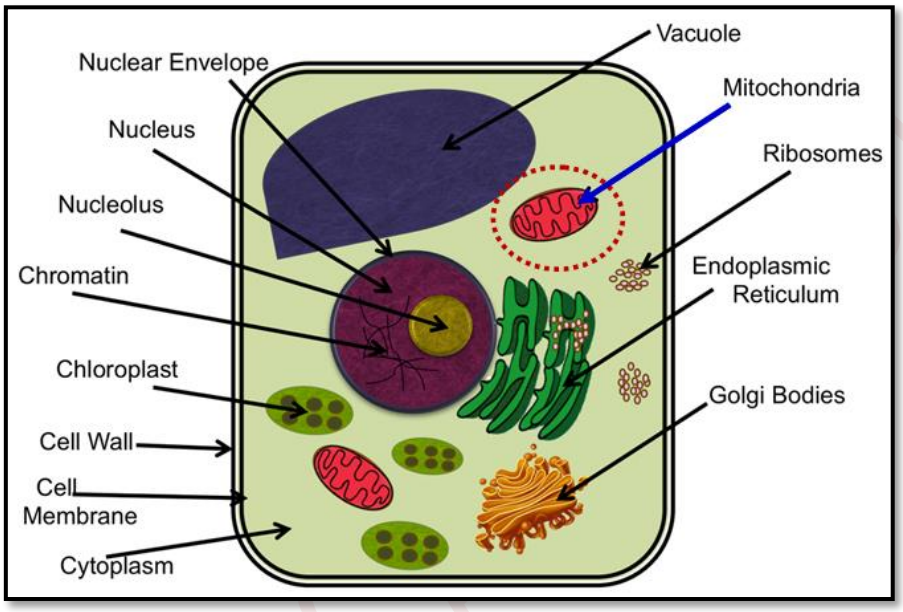



Y = Chloroplast
Photosynthesis occurs in the chloroplasts which can trap sunlight.
Starch is stored in stroma – a dense fluid within the chloroplast.

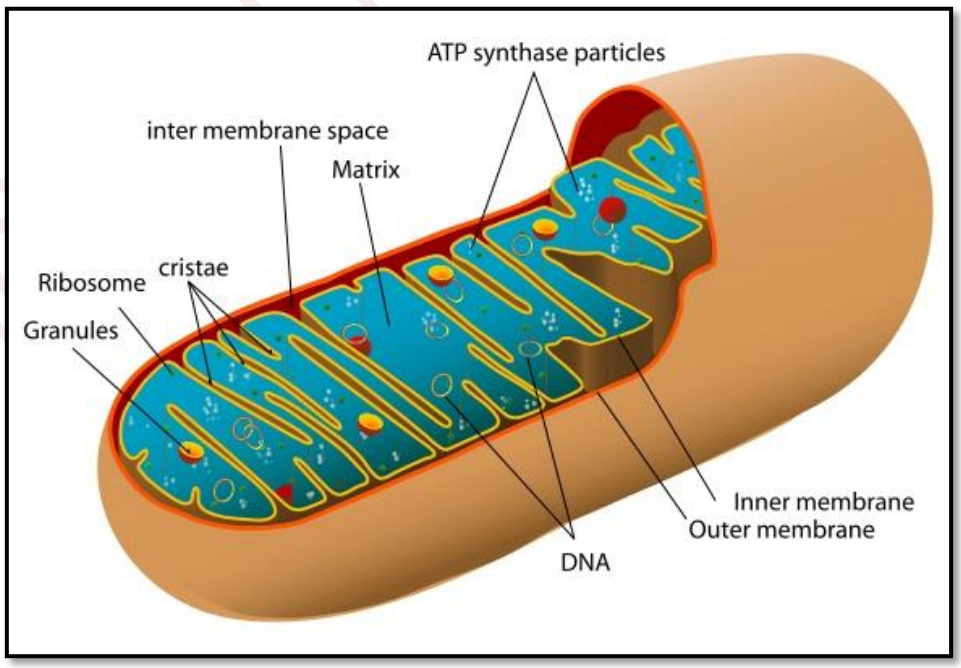
BACK TO QUICK ACCESS GRID

# S4

# B




The mitochondrion has a double membrane. The inner membrane is folded to increase the surface area.

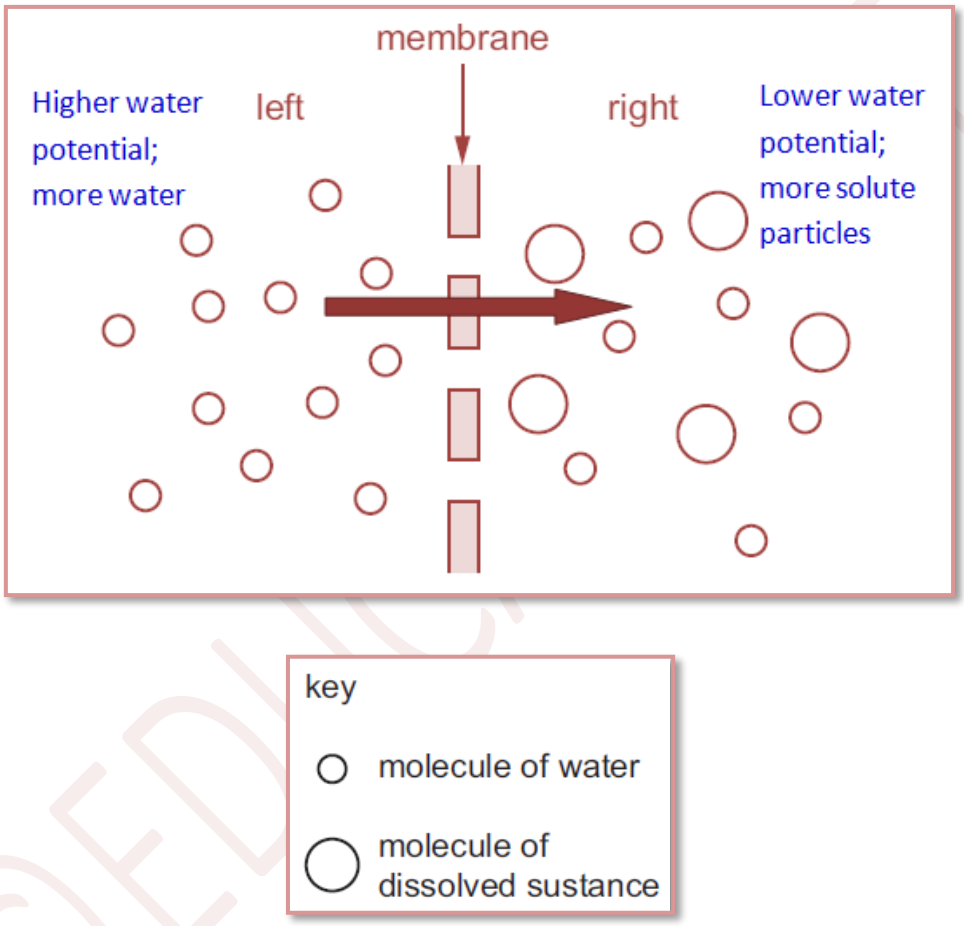



BACK TO QUICK ACCESS GRID

# S5

# D

Osmosis*




Decrease in length (shrinkage) of potato sticks suggests the movement of water molecules out of the potato cells which means that the sugar solution has a lower water potential than the potato cells.

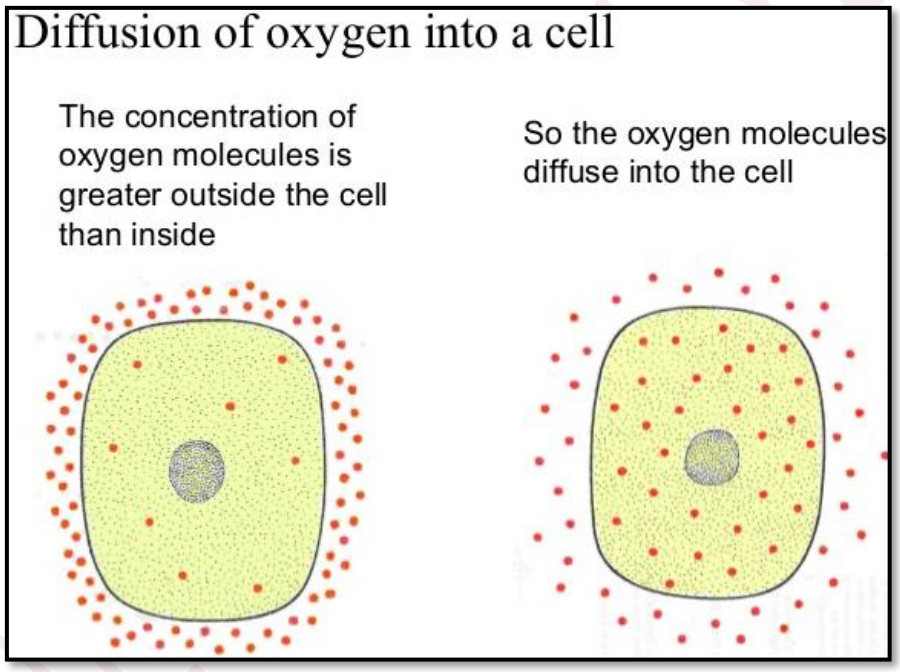
*Osmosis is the spontaneous NET (overall) movement of solvent molecules through a semi-permeable membrane into a region of higher solute concentration in the direction that tends to equalize the solute concentration on both the sides.

BACK TO QUICK ACCESS GRID

# S6

# B

Diffusion involves the movement of molecules from an area of higher concentration to an area of lower concentration.
Diffusion of Oxygen into a plant cell occurs due to movement of Oxygen molecules from Air (high concentration) to the cell (low concentration).

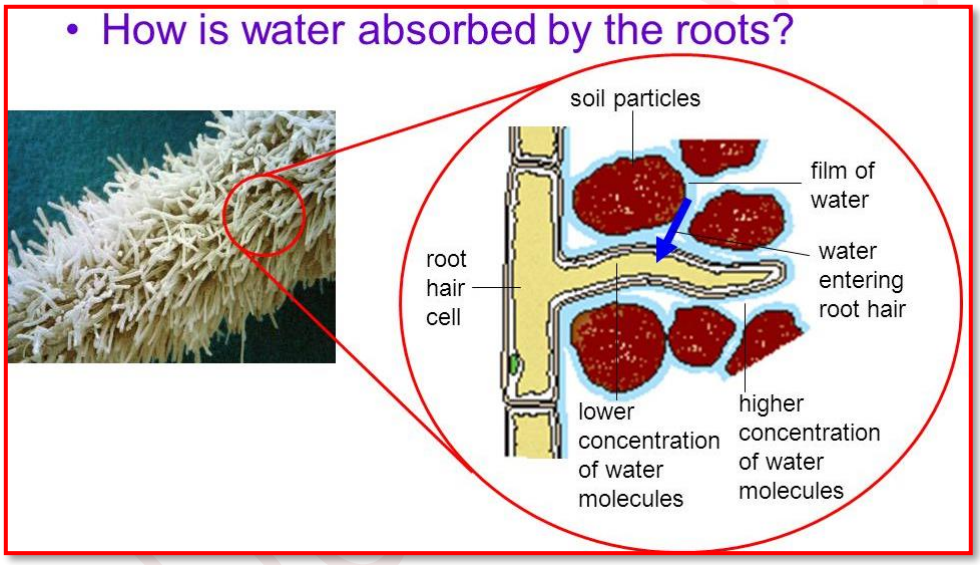



BACK TO QUICK ACCESS GRID

# S7

# A

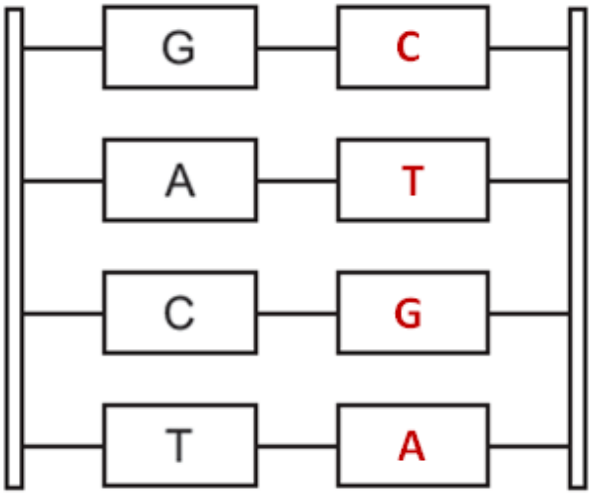
Absorption of water by root hairs from the soil occurs through the process of osmosis and does not require energy input.
All the other mentioned processes require energy (in the form of ATP).

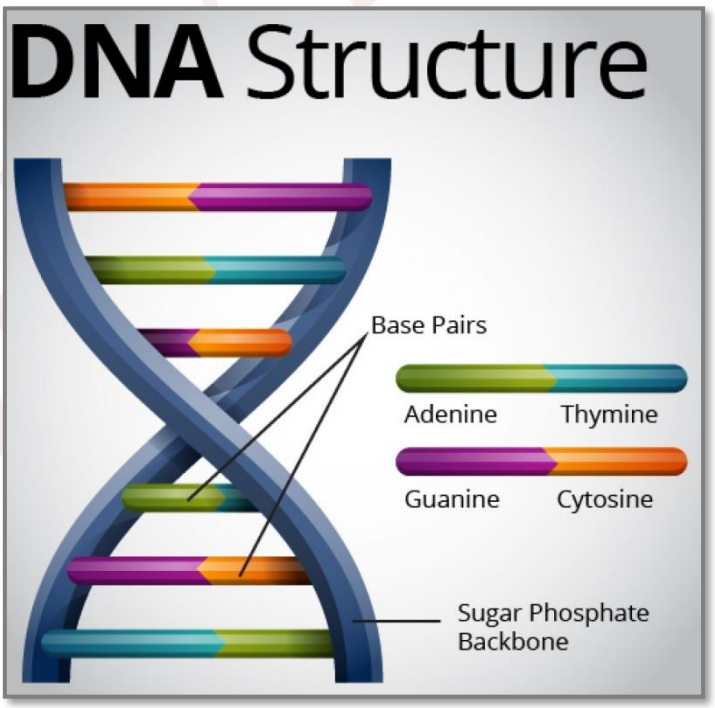



BACK TO QUICK ACCESS GRID

# S8

# B



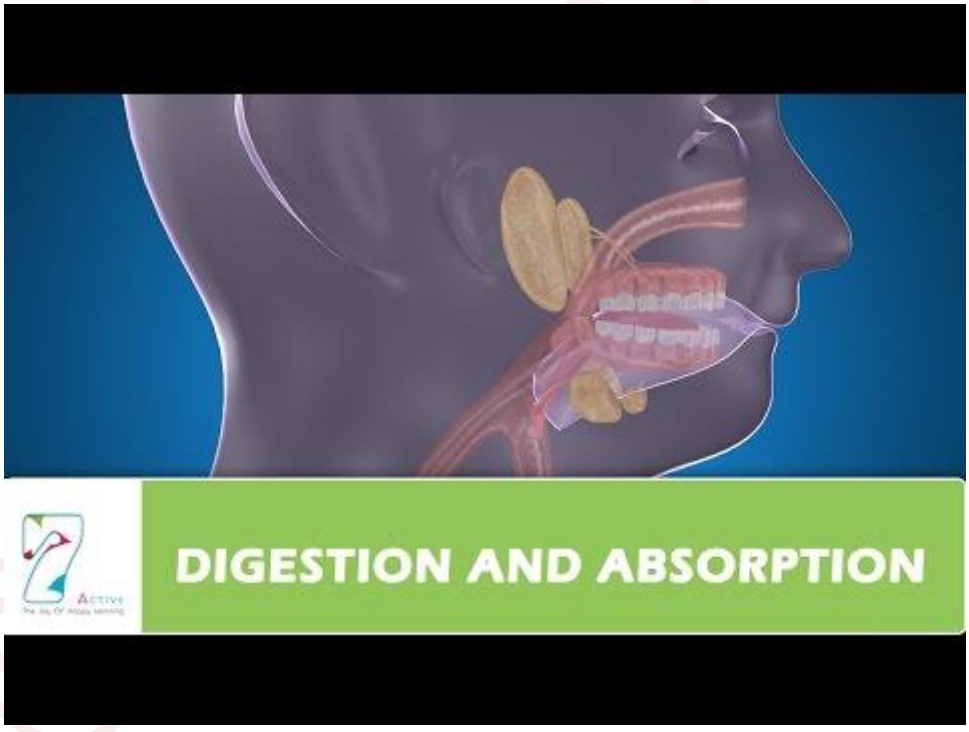




BACK TO QUICK ACCESS GRID

# S9

# C

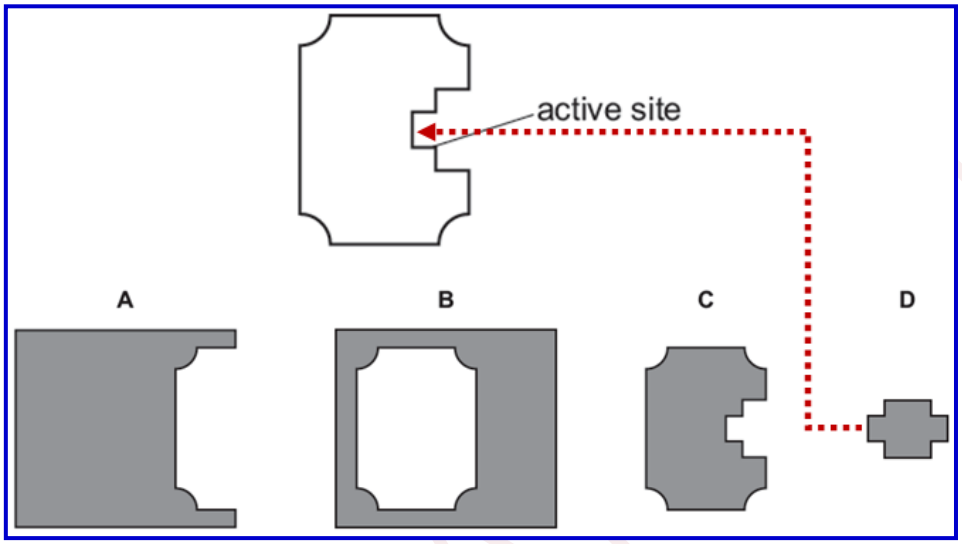
The process of breakdown of complex food particles into simpler forms (small molecules) for absorption is called DIGESTION.



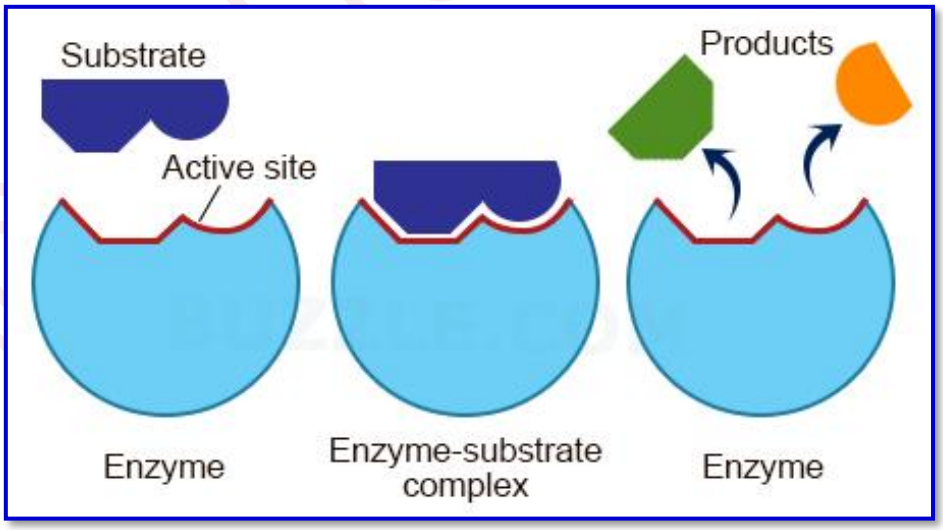

BACK TO QUICK ACCESS GRID

# S10

# D




The substrate should have a complementary shape to the active site on the enzyme.




BACK TO QUICK ACCESS GRID

# S11

# D

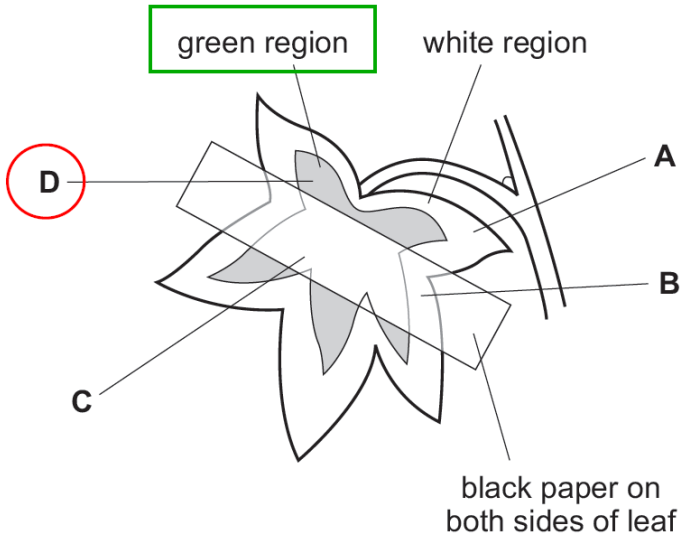
37℃ is the optimum temperature for all enzymes – maximum enzyme activity.
The optimum pH for the action of salivary Amylase is 7.



BACK TO QUICK ACCESS GRID

# S12

# D




Presence of Chlorophyll and Sunlight are essential for photosynthesis.

The green region contains chlorophyll and can photosynthesize when exposed to light. Starch is formed as a result of photosynthesis.

The white region is devoid of chlorophyll and cannot photosynthesize, hence no starch.

The green region covered with black paper is not exposed to light and cannot photosynthesize, hence no starch.

BACK TO QUICK ACCESS GRID

# S13

# C

Nitrate ions are used for protein synthesis in plants. Deficiency of nitrate ions therefore results in protein deficiency causing stunted growth.

Magnesium ions are used in the synthesis of Chlorophyll in plants. Deficiency of Magnesium ions therefore leads to yellowing of leaves.

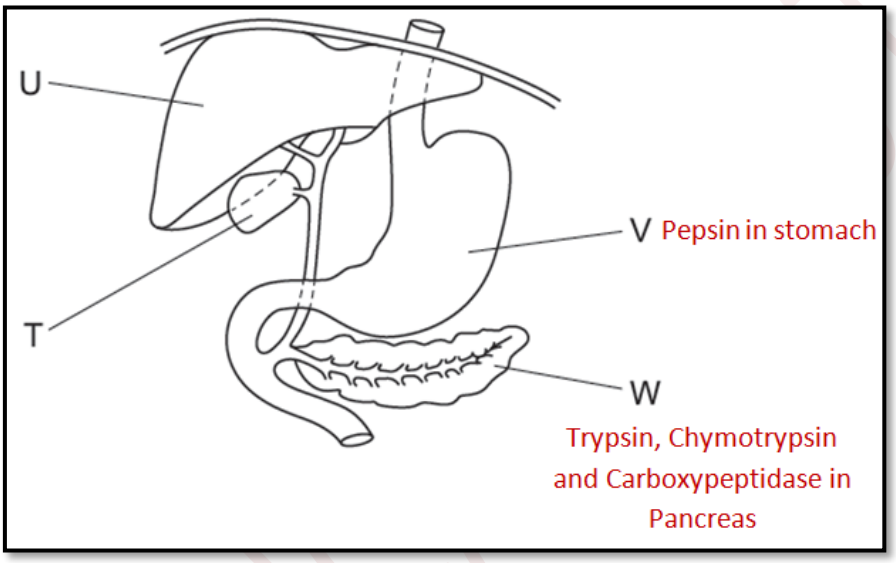


BACK TO QUICK ACCESS GRID

# S14

# C

Enzymes for Protein digestion




BACK TO QUICK ACCESS GRID

# S15

# B

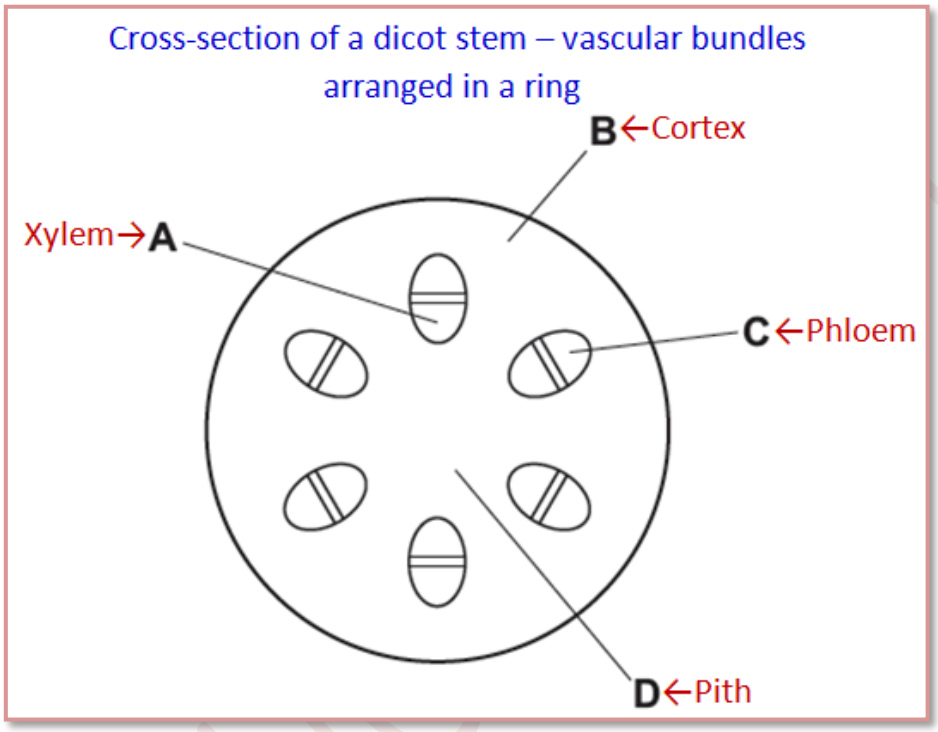
pH lowers with time after eating indicating the formation of acids. Acids can dissolve tooth enamel.



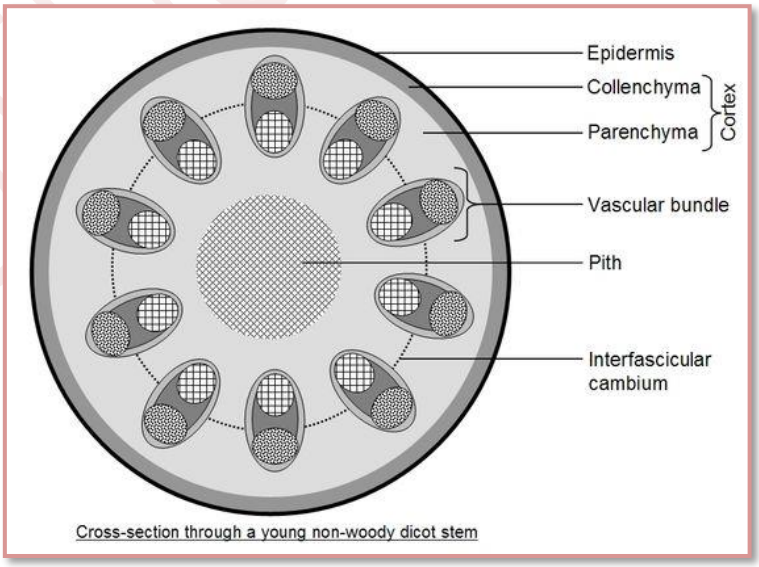
BACK TO QUICK ACCESS GRID

# S16

# A




Xylem is a vascular tissue used for transportation of water. Hence will stain red.

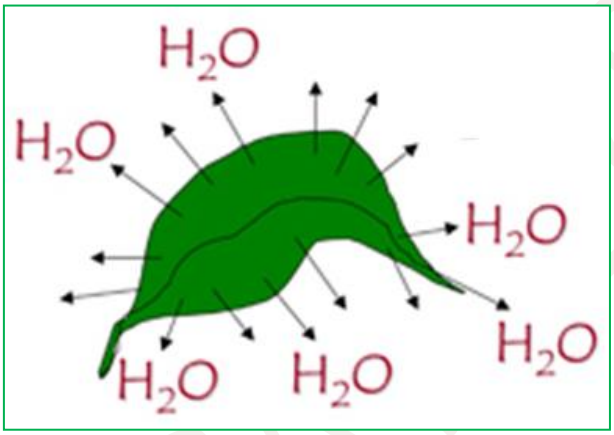



BACK TO QUICK ACCESS GRID

# S17

# B

During transpiration, water diffuses out of the leaves.

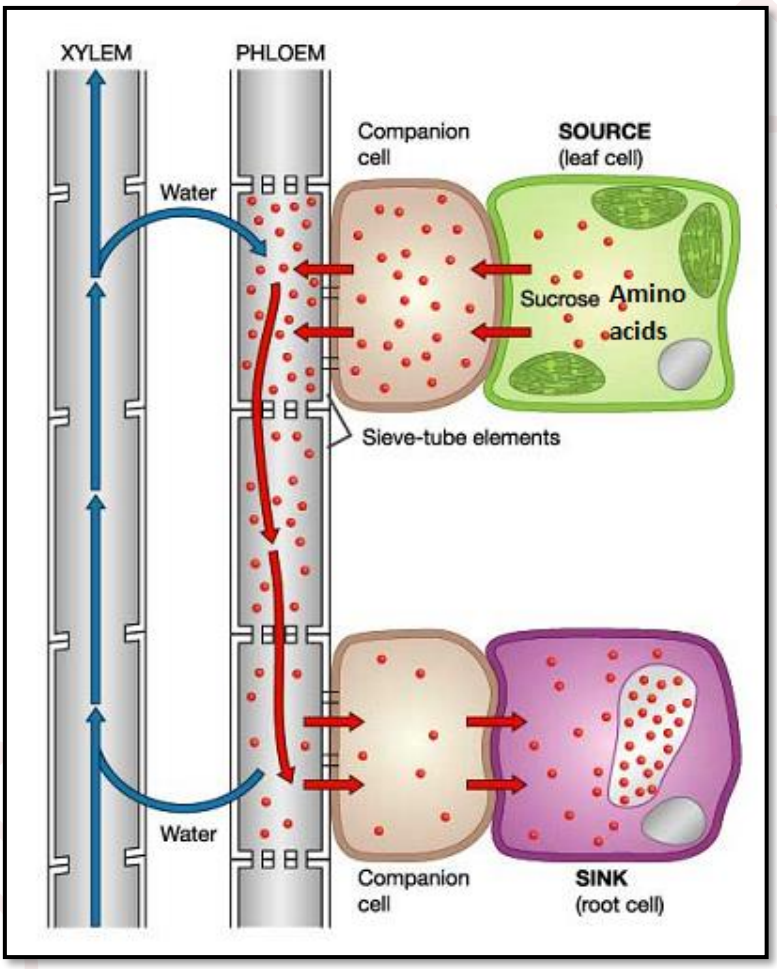



*Diffusion is the movement of molecules from a region of high concentration to a region of low concentration.

# S18

# C

## Translocation





BACK TO QUICK ACCESS GRID

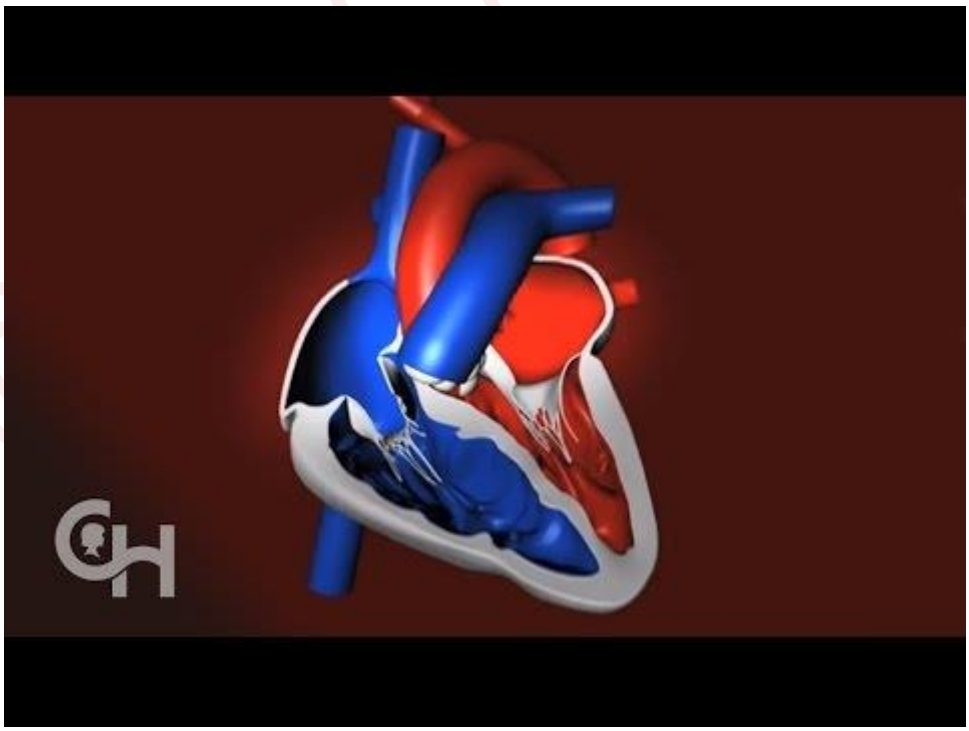
# S19

# C

Thickest ⟶ Thinnest
Left ventricle → Right ventricle → Atria

The ventricles of the heart have thicker muscular walls than the atria as blood is pumped out of the heart at greater pressure from the ventricles as compared to the atria.

The left ventricle has a thicker muscular wall than the right as greater forces are required to pump blood through the systemic circuit (around the body) as compared to the pulmonary circuit (to the lungs).



BACK TO QUICK ACCESS GRID

# S20

# C

Aspirin reduces the tendency of the platelets to clump together and prevents blood clotting; thus, prevents heart attacks.

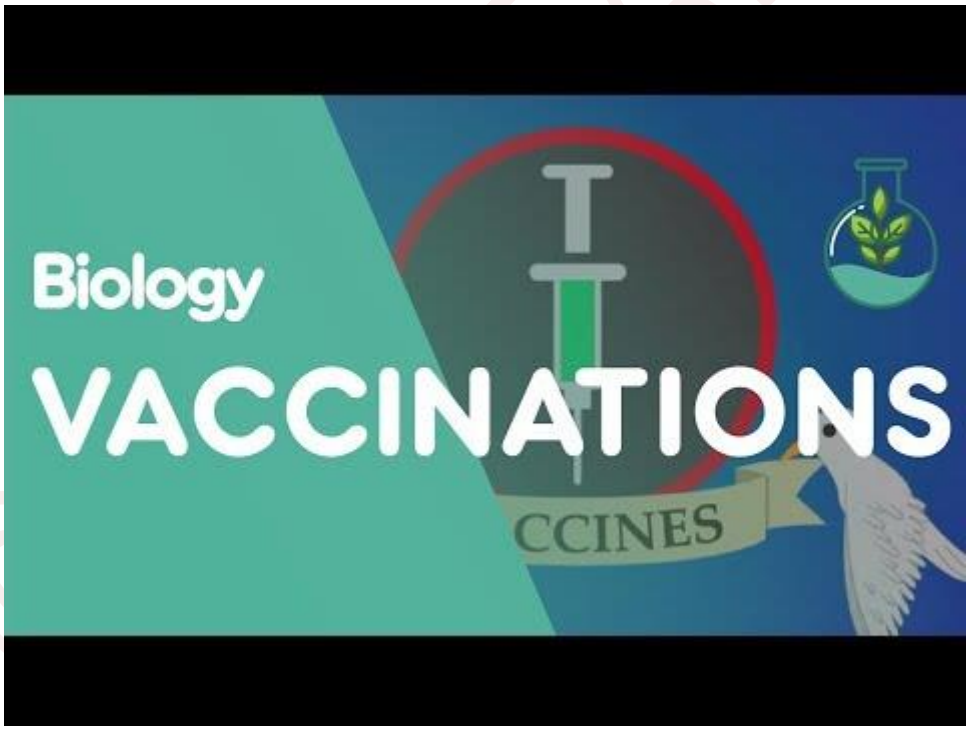


BACK TO QUICK ACCESS GRID

# S21

# B

Vaccination will stimulate the child's immune system to produce antibodies and immune memory cells which will protect the child in case of an actual Tuberculosis infection in future. Since the child's own antibodies are involved, vaccination is considered to provide ACTIVE IMMUNITY.




BACK TO QUICK ACCESS GRID

# S22

# C

Thin walls and large surface area of alveoli help the Oxygen to be absorbed rapidly into the blood in the lungs.


BACK TO QUICK ACCESS GRID

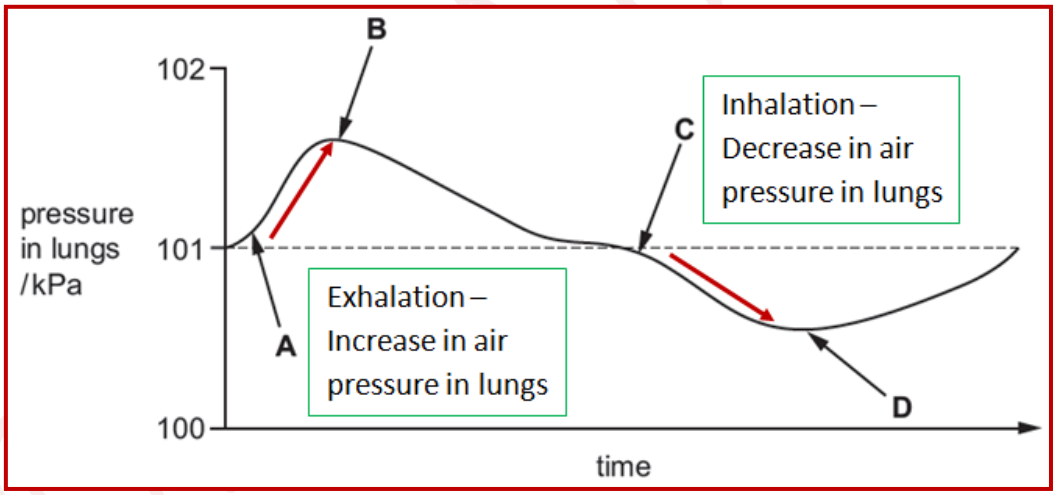
# S23

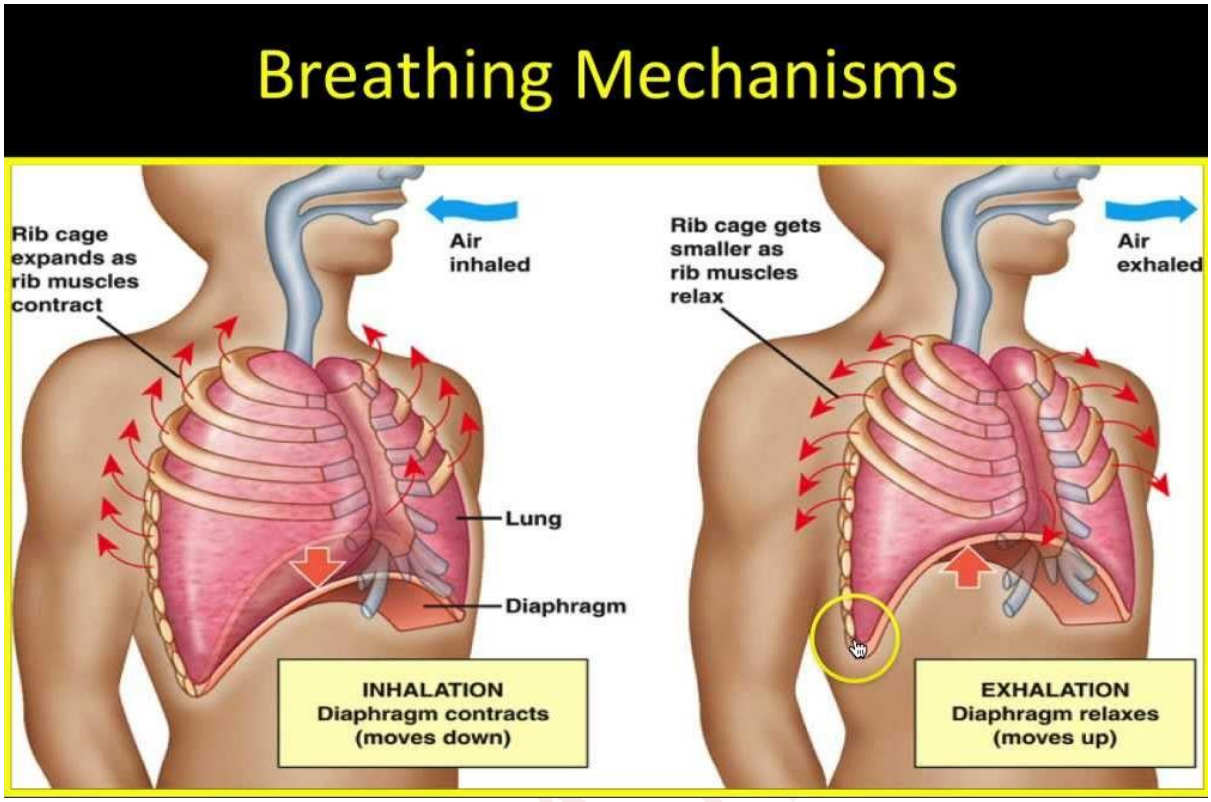
# A

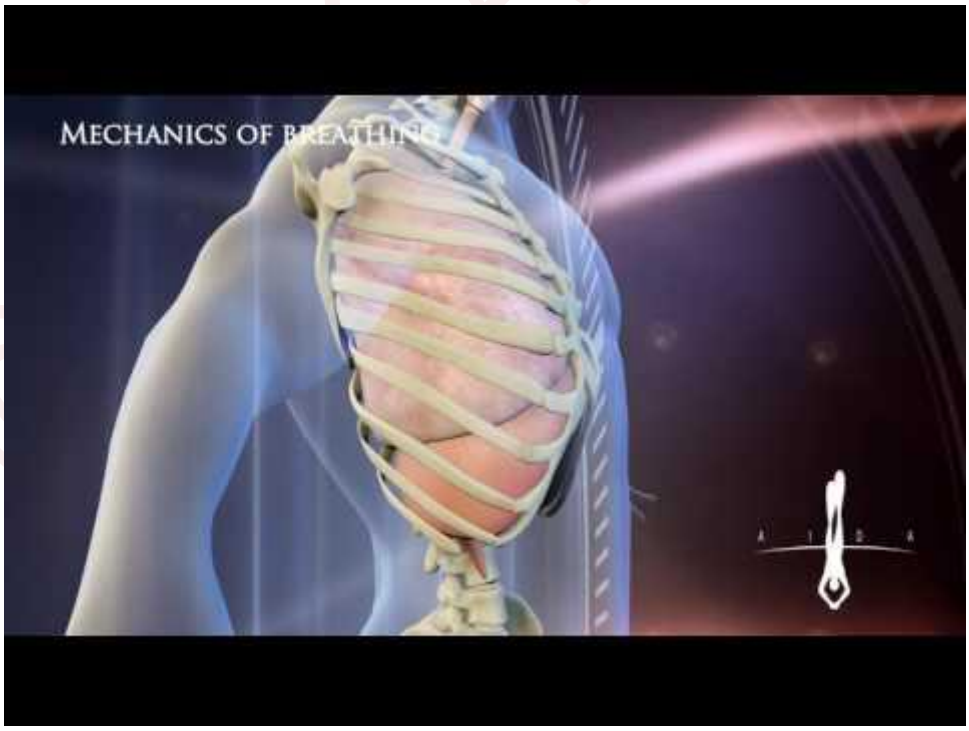
Air flows from a region of high pressure to low pressure.

Upon inhalation, the diaphragm and intercostal muscles contract; the chest cavity expands and the ribs are elevated. This lowers the air pressure in the chest cavity compared to atmospheric pressure causing the air to flow in the lungs through the airways.

Upon exhalation, the diaphragm and intercostal muscles relax; the chest cavity size decreases and the ribs are lowered. This increases the air pressure in the chest cavity causing the air to flow out of the lungs through the airways.





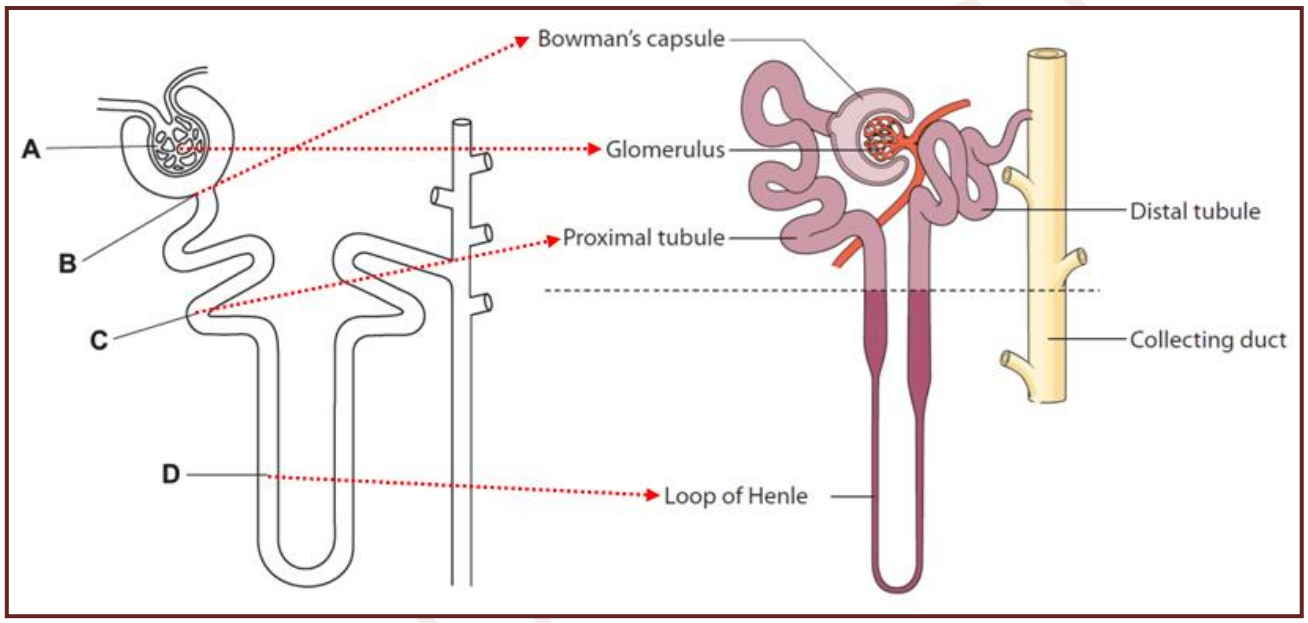




BACK TO QUICK ACCESS GRID

# S24

# A

Filtration occurs in the Glomerulus into the Bowman's capsule.

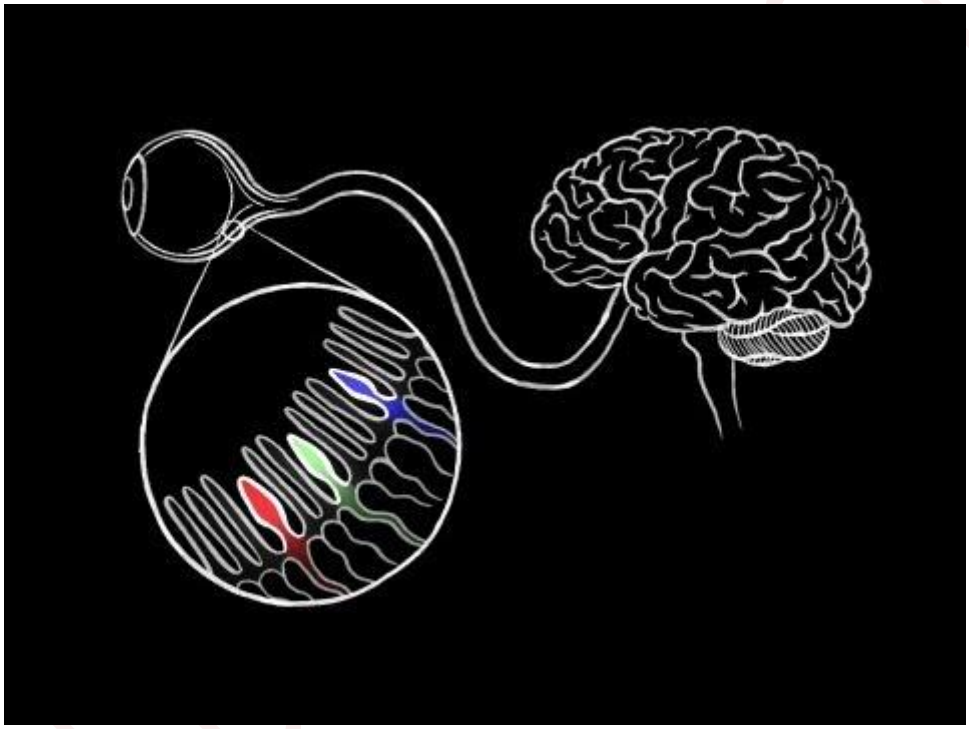



BACK TO QUICK ACCESS GRID

# S25

# D

For a human being with normal colour vision, white light is seen when all three cones are stimulated.



BACK TO QUICK ACCESS GRID

# S26

# C

| | insulin | glucagon | glycogen |
|---|---|---|---|
| A | decreases | decreases | increases |
| B | decreases | increases | decreases |
| C | increases | decreases | increases |
| D | increases | increases | decreases |

The concentration of blood sugar increases after eating a meal rich in carbohydrate such as a large bowl of rice.
Insulin is released from the islet cells.
When the insulin reaches the liver, it stimulates the liver cells to take up glucose from the blood and store it as glycogen.

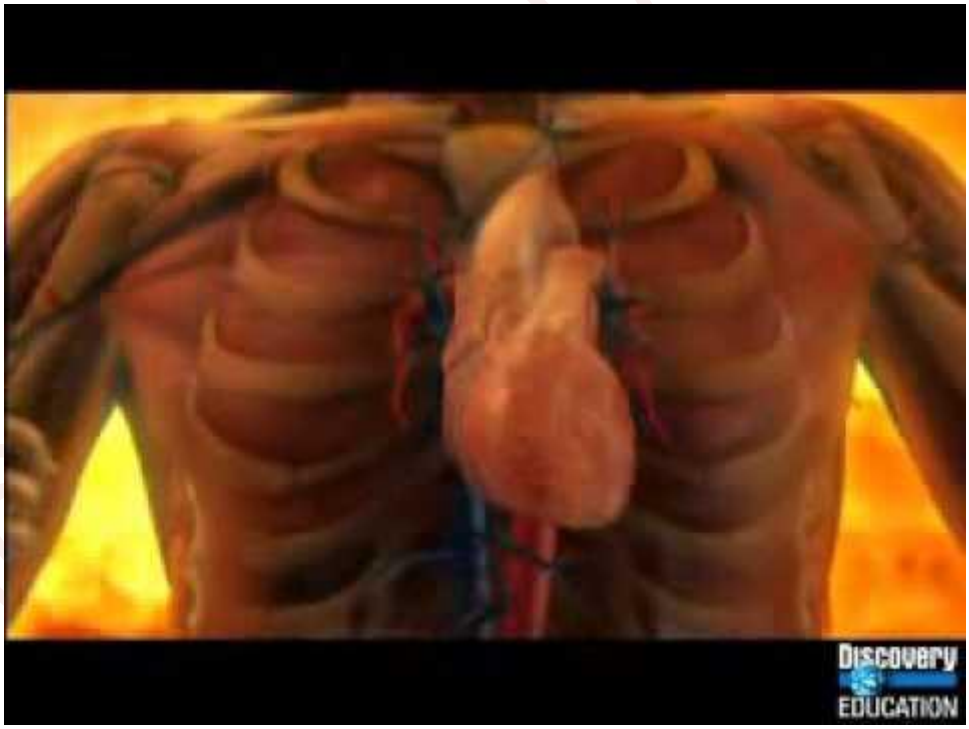
The amounts of Insulin and Glycogen therefore increase while that of Glucagon decreases.

BACK TO QUICK ACCESS GRID

# S27

# A

Adrenaline plays an important role in the fight or flight response by increasing the blood flow to the muscles. This causes an increase in the cardiac output leading to increase in breathing rate, higher pulse rate and dilation of pupils.
The increase in metabolism and energy production increases the body temperature. Adrenaline stimulates the sweat glands and causes increased sweating in order to cool down the body.

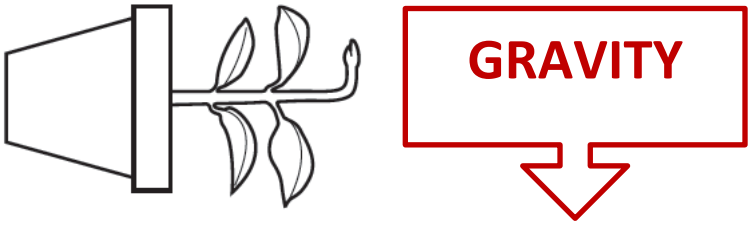



BACK TO QUICK ACCESS GRID

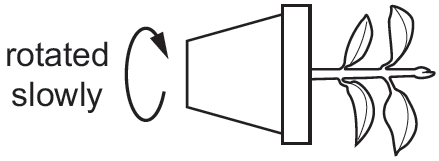
# S28

# A

The shoot is **negatively gravitropic**. It grows away from gravity.




**A**




in dark

The stationary stem has responded to the stimulus of one-sided gravity by growing towards it.

Rotation of the stem has allowed gravity to act on all sides equally and there is no one-sided stimulus, even though the stem was horizontal.
It is therefore a suitable control for this experiment

# S29

# A

Drinking too much alcohol can cause a person to be physically and psychologically dependent on it to an extent that the person cannot function without it (lack of self-control).

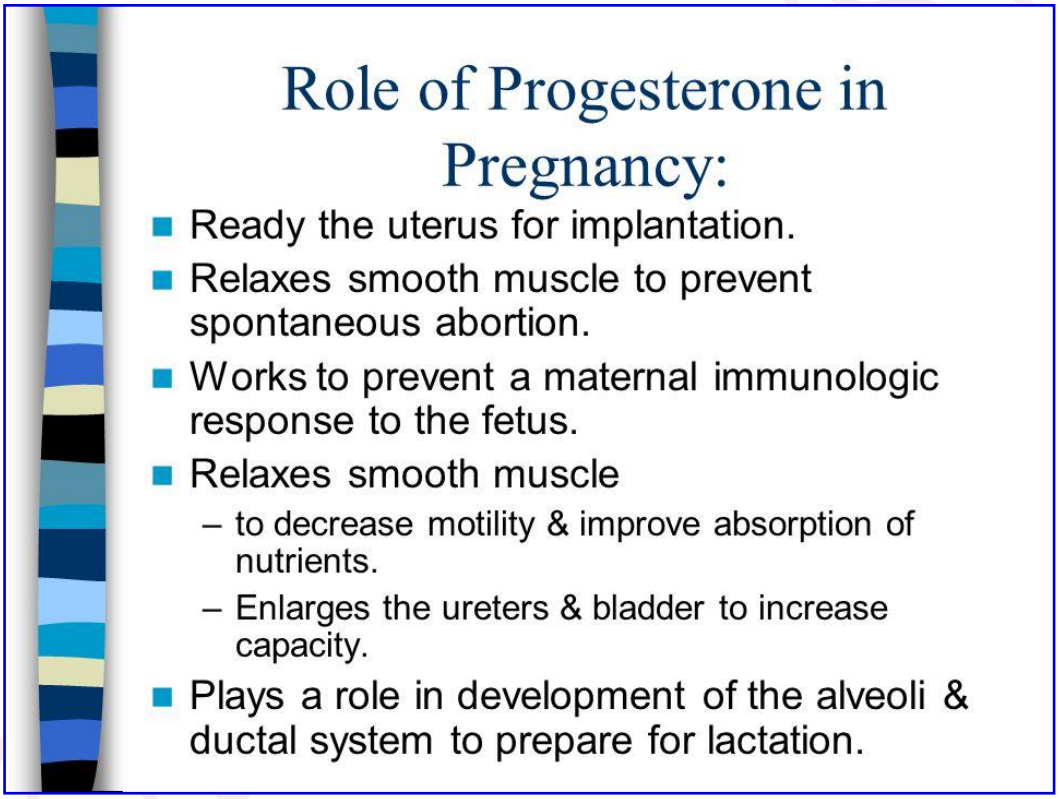
Over a period of time, it will lead to TOLERANCE and then to ADDICTION. Trying to break free from it after getting addicted will cause severe withdrawal symptoms.


BACK TO QUICK ACCESS GRID

# S30

# C

Progesterone, released by the corpus luteum maintains the uterine lining during pregnancy. It thickens the uterine lining so that it is ready to receive and nourish a fertilized egg.

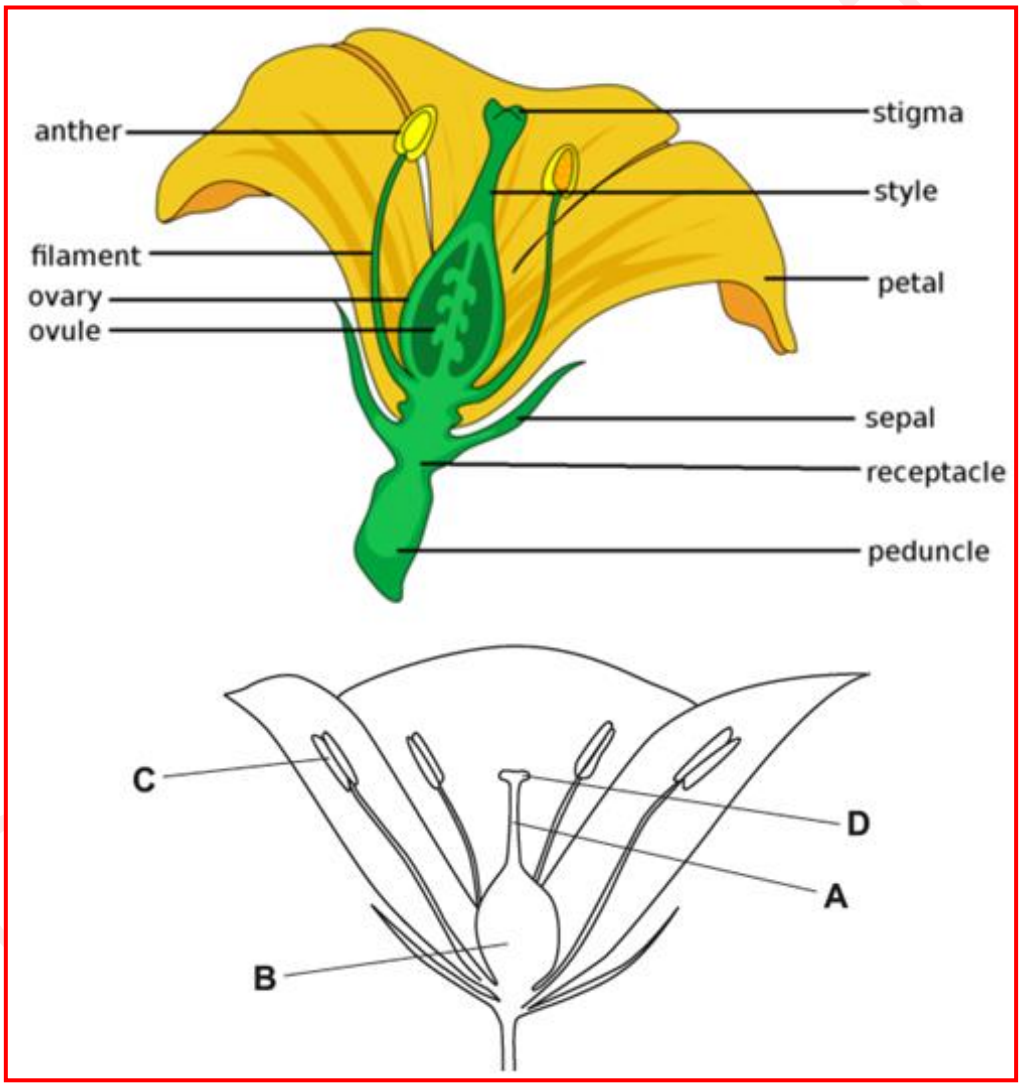



BACK TO QUICK ACCESS GRID

# S31

# B

The seeds develop from the ovules present in the ovary.




BACK TO QUICK ACCESS GRID

# S32

# D

**The chance of one sperm cell reaching an egg is very small.**

Although a single ejaculation may contain over three hundred million sperms, only a few hundred will reach the oviduct and only one will fertilise the ovum.

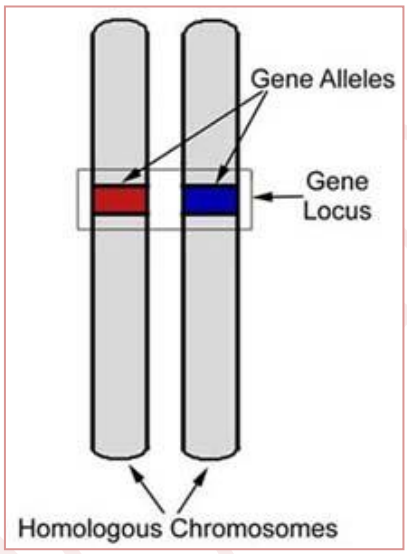


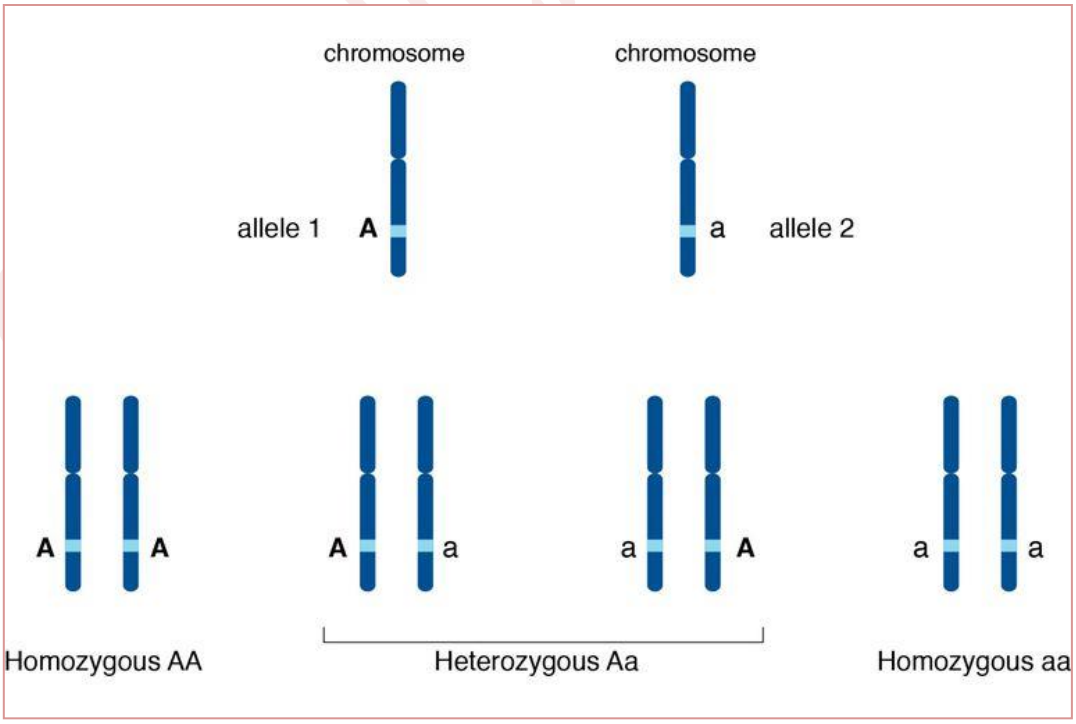
BACK TO QUICK ACCESS GRID

# S33

# B

Alleles are each of two or more alternative forms of a gene that arise by mutation and are found at the same place on a chromosome.

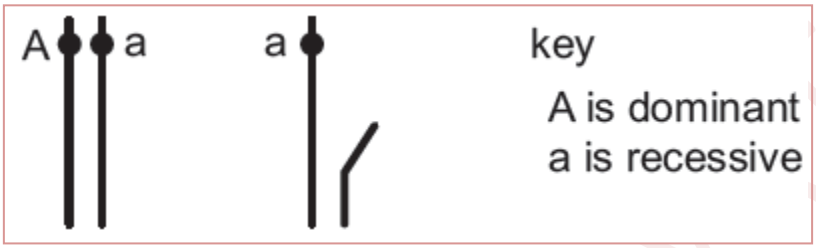



BACK TO QUICK ACCESS GRID

# S34

# C



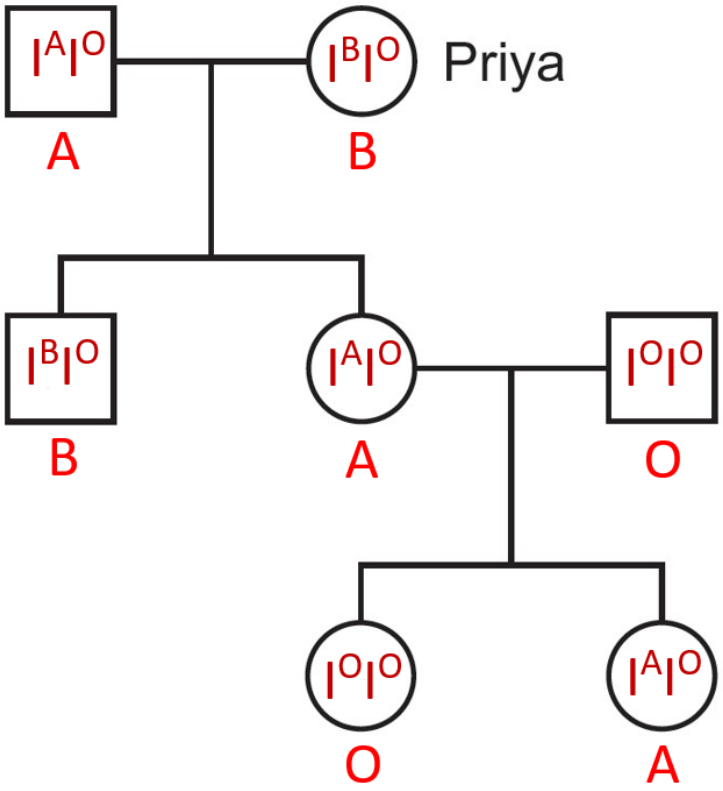

| | Male gametes ↓ | |
|---|---|---|
| Female gametes ↓ | A | a |
| a | A a | a a |
| | A | a |

∴ there are 50% chances (2 out of 4) that their daughter will show the sex-linked condition.

BACK TO QUICK ACCESS GRID

# S35

# C




| Mother's Blood Type | Father's Blood Type: A | B | AB | O | Child's Blood Type |
|---|---|---|---|---|---|
| A | A or O | A, B, AB, or O | A, B, or AB | A or O | |
| B | A, B, AB, or O | B or O | A, B, or AB | B or O | |
| AB | A, B, or AB | A, B, or AB | A, B, or AB | A or B | |
| O | A or O | B or O | A or B | O | |

BACK TO QUICK ACCESS GRID

# S36

# B

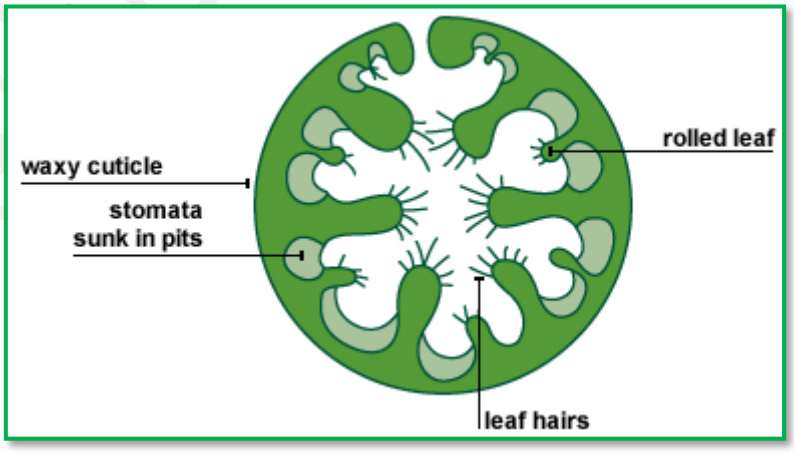
Hydrophytes are plants that are adapted to living in waterlogged soil/partly or wholly submerged in water.

Accordingly they exhibit the following adaptations:

- Large air spaces in the tissues – to overcome the difficulty of obtaining gases from the water and for buoyancy
- Leaves with stomata on upper surface – to facilitate gas exchange
- Roots and xylem reduced – due to availability of abundant water and for flexibilty

Rolled up leaves covered with hairs is a feature of Xerophytes.

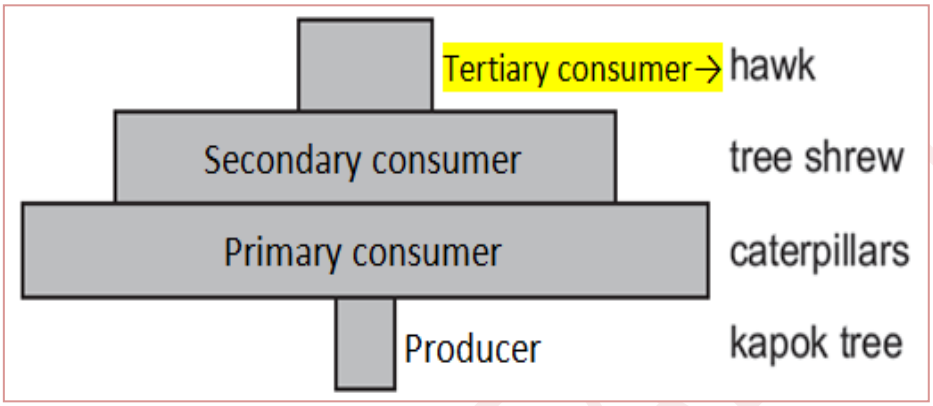
Xerophytes are adapted to survive in environments with scarce water.
Accordingly, they possess waxy cuticle, sunken stomata lined with fine hairs and rolled leaves, all of which help in reducing the loss of water due to transpiration.
The stomatal hairs trap the moist air and lengthen the diffusion pathway, thereby reducing evaporation.
Rolled leaves reduce the surface area exposed to wind (prevent drying).




BACK TO QUICK ACCESS GRID

# S37

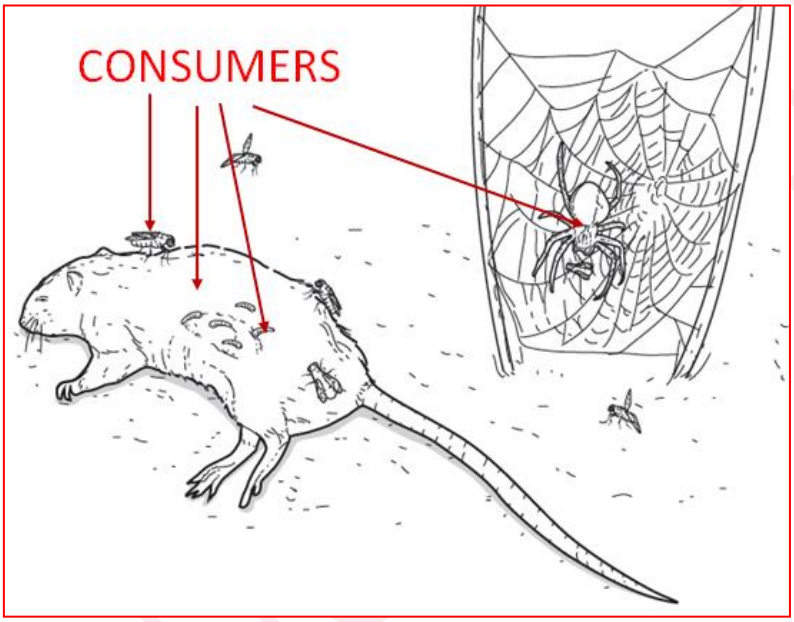
# D



# S38

# D

A producer (Plants that photosynthesise) is needed to complete the food chain.



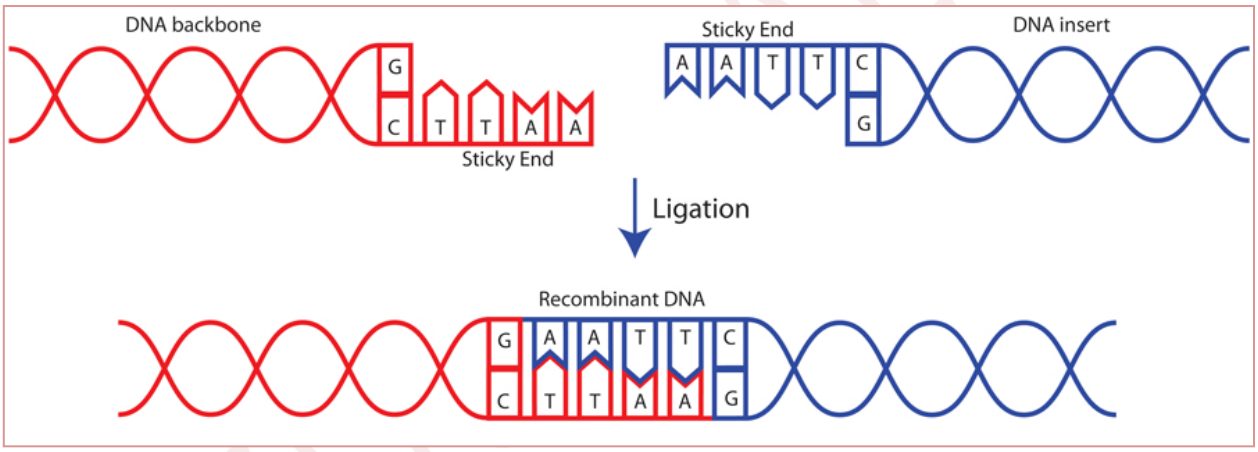

BACK TO QUICK ACCESS GRID

# S39

# B

Isolation of DNA and cutting of bacterial plasmid with restriction enzymes results in the formation of 'sticky ends'.

The sticky ends have complementary nucleotide base sequence that enables them to be connected by base pairing.

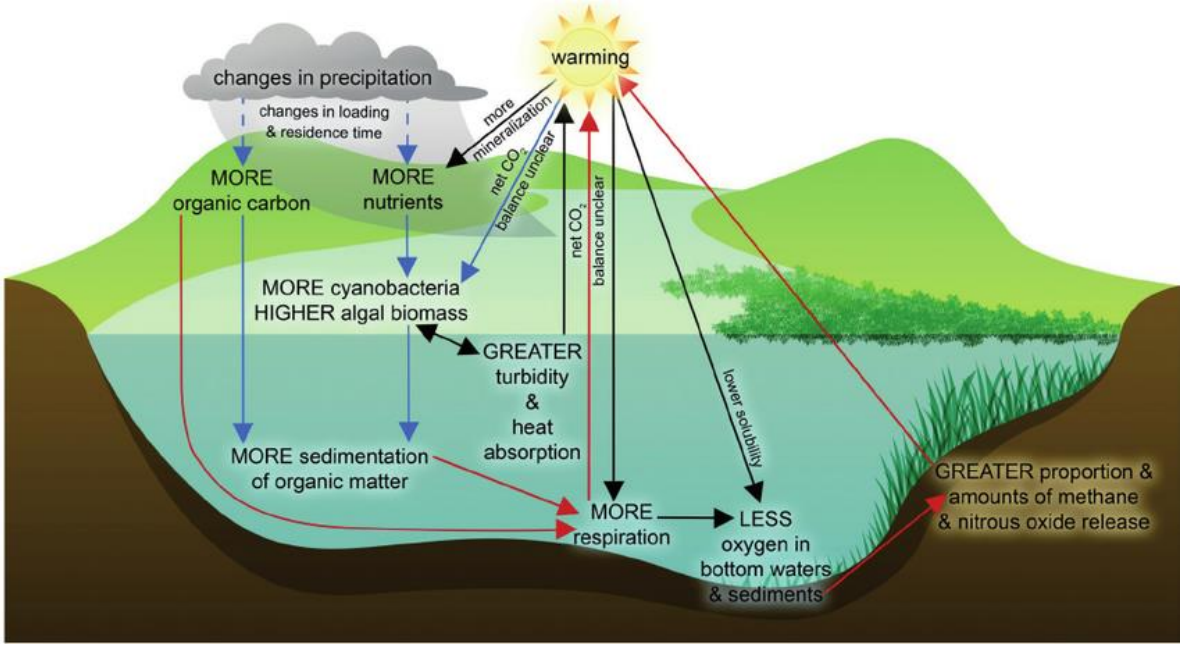



BACK TO QUICK ACCESS GRID

# S40

# A

The death of fish occurs due to reduction in dissolved Oxygen content.
The decomposers use up the dissolved Oxygen to decompose the bulk of organic matter in the water body.


BACK TO QUICK ACCESS GRID

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